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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PATENT DEPARTMENT
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EXAMINER
DANG, IAN D

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,561	ENRIGHT ET AL.	
	Examiner	Art Unit	
	Ian Dang	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8, 11-14, 31-41, 48, 59-70, 73-76, 79, 83, 86-87, 105-114, 116, 118, 120, 122-133* is/are pending in the application.

4a) Of the above claim(s) *31-41, 48, 59-70, 73-76, 79, 83, 86-87, 105-114, 116, 118, 120, 122-126, 128, 131-133* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11-14,17,127,129 and 130* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-8, 11-14, 17, 127, 129, and 130 in the communication filed on 07/05/2006 is acknowledged. The traversal is on the ground(s) i) there is no undue burden to search Groups I-V and ii) the sequences are not distinct. This is not found persuasive for the following reasons:

Applicant's attention is directed to MPEP 808.02 which states that "Where the related inventions as claimed are shown to be distinct under the criteria of MPEP 806.05(c-I), the examiner, in order to establish reasons for insisting upon restriction, must show by appropriate explanation one of the following: (A) Separate classification thereof: (B) A separate status in the art when they are classifiable together; (C) A different field of search." As set forth in the Restriction requirement, the separate classification established for each Group demonstrates that each distinct Group has attained recognition in the art as a separate subject for inventive effort, and also a separate field of search. Thus, the Restriction requirement is proper.

Applicant argues that no burden is placed on the examiner to consider all claims. As discussed above, the separate classification established for each Group demonstrates that each distinct Group requires a separate field of search, and a search of one Group would not reveal art on the other Groups, thus imposing a burden on the examiner. Furthermore, each group requires a non-coextensive sequence and non-patent literature search.

The requirement is still deemed proper and is therefore made FINAL. Claims 31-41, 48, 59-70, 73-76, 79, 83, 86-87, 105-114, 116, 118, 120, 122-126, 128, and 131-133 are withdrawn from further consideration pursuant to 37 CFR 1.142(b).

Claims 1-8, 11-14, 17, 127, 129, and 130 are pending and under examination.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-8, 11-14, 17, 127, 129, and 130 rejected on the ground of nonstatutory double patenting over claims 1-109 of U. S. Patent No. 6,635,740 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: a DNA sequence encoding a peptide wherein the first domain comprises a hormone and a second domain comprises a lytic peptide.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

35 USC § 101-non-statutory subject matter

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 129 and 130 are rejected under 35 USC § 101 because the claimed invention is directed to non-statutory subject matter.

The claims read on cells within a gene therapy patient and thus read on a human being. Human beings are considered non-statutory subject matter.

Claim Rejections - 35 USC § 112 (New Matter)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8, 11-14, 17, 127, 129, and 130 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **This is a new matter rejection**.

The claimed invention is a DNA sequence encoding a peptide comprising a hormone in the first domain and a lytic peptide in the second domain. Applicants contemplated "genes encoding a lytic peptide or encoding a lytic peptide/peptide hormone fusion" as disclosed in column 7 lines 46-49 in the US patent 6,635,740. However, the invention is of different scope from the specification as originally filed. In the instant application, the term "A DNA sequence"

is broader than the term "genes encoding" the specification as originally filed because "a DNA" encompasses cDNA, genomic DNA, and any other types of DNA.

Thus, the amendment is a departure from the specification as originally filed.

Claim Rejections - 35 USC § 112(Written Description)

Claims 1-8, 11-14, 17, 127, 129, and 130 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

To provide adequate written description and evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of complete or partial structure/function correlation, and other identifying characteristics.

The claims are drawn to a DNA sequence encoding a peptide comprising bLH or beta subunit of gonadotropin-releasing hormone, lamprey III luteinizing hormone releasing hormone, beta chain of luteinizing hormone, luteinizing hormone, chorionic gonadotropin, the beta subunit of chorionic gonadotropin, follicle stimulating hormone, melanocyte-stimulating hormone, somatostatin and analogues of these hormones in the first domain and a lytic peptide consisting of a cecropin peptide, melittin peptide, defensin peptide, a magainin peptide, a sarcotoxin peptide, and analogs of said peptides in the second domain. While these hormones and peptides are known in the art, such is not the case for analogues of these hormones and analogs of said peptides.

In analyzing whether the written descriptions for analogues of these hormones and analogs of said peptides are met for genus claims, it is first determined whether a representative number of species have been described by the complete structure. Applicant's specification provides only examples for several hormones and peptides, but does not provide sufficient relevant identifying characteristics for analogues of these hormones and analogs of said peptides. In this case, the specification discloses analogues of these hormones and analogs of said peptides without identifying any specific structures for analogues of these hormones and analogs of said peptides.

Next it is determined whether a representative number of species have been sufficiently described by other relevant identifying characteristics, special features and functional attributes to place applicant in possession of the claimed genus. Applicant's disclosure fails to do so. For instance, a small peptide or small compound might also function as a hormone analogue or peptide analogue; however, no such hormones and peptide analogues are set forth in applicant's disclosure. Although Applicants has identified the functional attribute for the analogues of these hormones and analogs of said peptides, further structural studies are necessary to determine the physical and chemical attributes important to function as analogues of these hormones and analogs of said peptides and identify a sufficient number of species to place applicant in possession of the broad genus of analogues of these hormones and analogs of said peptides.

Accordingly, in the absence of sufficient recitation of distinguishing structural/physical and identifying characteristics, the specification does not provide adequate written description of the claimed genus.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3 and 127 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and 127 refer to " an analogue of one of those hormones" and claim 3 refers to "analogs of said peptides". The analogues are not clearly defined as written. The metes and bounds of the claims cannot be determined.

Claim Rejections - 35 USC § 112 (enablement)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 129 and 130 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a DNA sequence encoding a peptide comprising a hormone in its first domain and a lytic peptide in its second domain, does not reasonably provide enablement for any cell containing DNA for the purpose of gene therapy. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make/use the invention commensurate in scope with these claims.

In In re Wands, 8USPQ2d, 1400 (CAFC 1988) page 1404, the factors to be considered in determining whether a disclosure would require undue experimentation include: (1) Nature of the invention, (2) the state of the prior art, (3) the predictability or lack thereof in the art, (4) the amount of direction or guidance present, (5) the presence or absence of working examples, (6) the breath of the claims, (7) the quantity of experimentation needed, (8) relative skill of those in the art.

Nature of the invention and breath of the claims

The claims are to a cell containing a DNA sequence encoding lytic peptide hormone fusion. The invention is broad because the recitation of claims 1 and 127 encompasses any cell in either *the in vitro* or *in vivo* environment. The breath of the claims includes the uses of the claimed invention for gene therapy.

Unpredictability and state of the art

The art of gene therapy is not predictable because vectors delivering DNA, such as the claimed invention in this instant application, have not been optimized for use in humans. Verma et al. (1997) teach that the Achilles heel of gene therapy is gene delivery because the problem has been an inability to deliver genes efficiently and to obtain expression (page 239, column 3, 2nd paragraph). The first approach comprising the non-viral vectors, ranging for direct injection of DNA to mixing the DNA with polylysine or cationic lipids suffer from poor efficiency of delivery and transient expression of the gene. In another approach the use of viruses is a powerful technique, because many of them have evolved a specific machinery to deliver DNA to cells. However, humans have an immune system fighting off the virus and hampering the attempts to deliver genes in viral vectors. In view of these teachings, the use of the DNA encoding a lytic peptide fusion hormone is unpredictable. Thus Applicants are not enabled for the claimed invention because they have not provided any support overcoming the unpredictability of using a DNA encoding lytic peptide fusion hormone for gene therapy in the specification.

The amount of direction or guidance present

Applicants' disclosure is limited to administering the lytic peptide hormone fusion as therapeutics in cells and animals. The specification does not provide guidance or direction regarding how to administer the claimed invention to cells *in vitro* or *in vivo*. Either setting

requires different methods for using the claimed invention, such as delivery vectors or transfection reagents. In addition, the methods and tools require to administer DNA are different from the ones for protein. For instance, a dose of lytic peptide hormone fusion administered to an organism can be easily measured, but the amount of protein generated from a DNA encoding the claimed invention is more difficult to measure. The level of protein production depends on the delivery vector and on the type of cells infected or transfected.

Working Examples

Although Applicants have provided examples administering the lytic peptide hormone fusion as therapeutics to cells and animals, the specification does not provide any examples regarding the DNA encoding a lytic peptide hormone for the specificity of delivery a DNA encoding the lytic peptide hormone to a hematopoietic stem cell or a myeloid precursor cell. As a protein the claimed invention can specifically target cells with a specific epitope of the cell surface. However, a DNA encoding the lytic peptide hormone fusion does not recognize specific cells, since the DNA does recognize specific epitopes. For a DNA encoded protein, the specificity for delivering the construct to a specific cell population depends on the vector delivering the DNA. In view of the unpredictability of DNA delivery vectors, the lack of working examples contributes to the unpredictability of the art.

The quantity of experimentation needed

Because the claims are broadly drawn to a DNA encoding a lytic peptide hormone fusion and to a cell containing it, and because Applicant's disclosure does not contain sufficient teachings to overcome the unpredictability taught in the art, it would require undue experimentation by one of skill in the art to be able to practice the invention commensurate in scope with the claims.

Conclusion

No claims are allowed

Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian Dang whose telephone number is (571) 272-5014. The examiner can normally be reached on Monday-Friday from 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brenda Brumback can be reached on (571) 272-0961. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ian Dang
Art Unit 1647
Patent Examiner
August 16, 2006

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